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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,179	11/26/2001	Kazuaki Yazawa	9792909-0434	9468

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EXAMINER

CUEVAS, PEDRO J

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 06/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/994,179

Applicant(s)

YAZAWA ET AL.

Examiner

Pedro J. Cuevas

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-6,8-29 and 37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,8-29 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 20, 2004 has been entered.

Response to Arguments

2. Applicant's arguments, see pages 9-11, filed May 20, 2004, with respect to the rejection(s) of claim(s) 1-36 under U.S.C. § 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patents No. 5,637,934 to Fabris, and No. 4,366,857 to Mayer.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 15-23 and 25-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 15 and 25 recite the limitation "closed loop" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-2, 4-6, 8-12, 14-17, 19-22, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,637,934 to Fabris.

Fabris clearly teaches the construction of a high expansion magnetohydrodynamic liquid metal generator of electricity comprising:

a fluid conduit (flux arrows of Figure 1) configured to channel an electrically conductive fluid (liquid metal 23) therethrough, the fluid conduit being thermally connected to an electrical component (51) capable of generating heat to cause the fluid to flow through the fluid conduit;

a heat exchanger (50) operatively positioned between the electrical component and the fluid conduit;

an energy converter (26) operatively coupled to the fluid conduit that generates energy in response to the flow of fluid;

wherein the energy converter includes a first electrode (30), a second electrode (32), and a permanent magnet (28) centrally displaced between them, the permanent magnet configured to create a magnetic field across the fluid whereby an electric potential is raised between the first electrode and the second electrode;

said fluid conduit including:

Art Unit: 2834

a first column (right coil in 50) and a second column (left coil in 40),
a first connective portion connecting the first column and the second
column, and

a second connective portion connecting the second column to the first
column wherein the first column being thermally connected to the electrical
component;

wherein a volatile fluid (21) is immersed in the fluid, the volatile fluid having a
lower boiling point than the fluid, evaporates due to the heat transferred to the fluid to
create gas bubbles in the fluid to further increase fluid flow of the fluid through the
energy converter, and the gas bubbles have diameters less than half a smallest diameter of
the fluid conduit; and

a second heat exchanger (40) is thermally coupled to the second column and
configured to extract heat from the fluid and dissipate the extracted heat.

8. With regards to claim 8, it has been held that the recitation that an element is “adapted to”
perform a function is not a positive limitation but only requires the ability to so perform. It does
not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
such that the subject matter as a whole would have been obvious at the time the invention was made to a person
having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the
manner in which the invention was made.

Art Unit: 2834

10. Claims 13 and 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,637,934 to Fabris in view of U.S. Patent No. 4,366,857 to Mayer.

Fabris disclose the construction of a high expansion magnetohydrodynamic liquid metal generator as described above.

However, it fails to disclose a heat exchanger, which dissipates the heat across a plurality of heat fins into a heat reservoir.

Mayer teaches the construction of a magnetic two-phase thermosiphon comprising a heat pipe (40) having plurality of heat fins (42) for the purpose of effecting heat exchange between hot and cold reservoirs.

It would have been obvious to one skilled in the art at the time the invention was made to use the heat pipe having plurality of heat fins disclosed by Mayer on the high expansion magnetohydrodynamic liquid metal generator disclosed by Fabris for the purpose of effecting heat exchange between hot and cold reservoirs.

11. With regards to claim 25, Fabris further disclose:

a plurality of electrical leads (electrical connection between electrode 30 and positive terminal, electrical connection between electrode 32 and negative terminal) coupled to the first electrode and the second electrode, the plurality of electrical leads transferring the electricity to an electrical storage (34).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Art Unit: 2834

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (571) 272-2021. The examiner can normally be reached on M-F from 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pedro J. Cuevas
June 22, 2004


JOSEPH WAKS
PRIMARY EXAMINER